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5 New Patent Claims

1. A process for the synthetic generation of methane; said process comprising the steps of

a) providing a feed gas mixture comprising carbon monoxide,

10 hydrogen, water vapour, CO₂ and volatile hydrocarbons (C₂ and higher) components and aromatic hydrocarbons; said feed gas mixture comprising unsaturated C₂ components and aromatic hydrocarbons, such as benzene, toluene and naphthalene, in the range of 1 to 10 Vol%, preferably 1 to 15 5 vol%;

b) bringing the feed gas mixture in contact with a fluidized bed catalyst having catalyst particles which comprise as catalytic active component a metal and/or a metal compound or a mixture thereof under the circumstances of:

20 c) an elevated temperature in the range of 250 to 450°C;

d) a feed gas pressure in the range of 0.8 to 70 bar;

e) a gas hourly space velocity of 1000 to 50000 h⁻¹; and

f) a concentration of H₂/CO in the initial gas mixture in the range of 0.25 to 5.

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2. The process according to claim 1,

characterized in that

the catalytic active component is nickel and/or a nickel compound, preferably a mixture of nickel and nickel oxide,

30 disposed on an ceramic carrier, such as Al₂O₃, TiO₂, SiO₂ or Y₂O₃ or mixtures thereof.

3. The process according to claim 2,

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characterized in that

the content of the catalytically active component is in the range of 20 to 100 weight%, preferably 40 to 60 weight%, as compared to the weight of the catalyst particles.

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4. The process according to claim 1, 2 or 3,

characterized in that

the size of the catalyst particles is in the range of 100 to 1000-5000 μm , preferably in the range of 50-200 to 500-1000
10 μm .

5. The process according to anyone of the preceding claims,
characterized in that

15 the gas hourly space velocity is in the range of 2000 to 10000
 h^{-1} , the temperature is in the range of 340 to 400°C and the
gas pressure is in the range of 1 bar.

6. The process according to anyone of the preceding claims,

20 characterized in that

a mean residence time of the feed gas mixture in the fluidized bed catalyst is in the range of 0.1 to 5 sec., preferably 0.2 to 1 sec.

25 7. The process according to anyone of the preceding claims,
characterized in that

the content of H₂/CO in the feed gas mixture is in the range of 0.8 to 2.